

REMARKS/ARGUMENTS

Favorable reconsideration of this application as currently amended and in view of the following remarks is respectfully requested.

Claims 1-13 and 15-19 are currently active in this case. Claims 1, 4, 5, 9, 12, 13, 15, 16, and 18 have been amended by the current amendment. No new matter has been added.

In the outstanding Office Action, Claims 1-3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Inoue '974 patent in view of Watanuki et al. and USP 6,574,214 to Khalil et al.; Claims 4 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatenatable over Inoue et al. (hereinafter referred to as "the Inoue '974 patent") in view of Leung; Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Momona in view of Inoue et al. (hereinafter referred to as "the Inoue '120 patent") and Khalil et al.; Claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hancock in view of Soliman et al., Watanuki et al., and Khalil et al.; Claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hancock in view of Soliman et al., Watanuki et al., and Momona; Claim 11 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hancock and Soliman et al. and Watanuki et al. as applied to Claim 9 and in further view of Inoue et al.; Claims 12 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Inoue '120 patent in view of Leung, Hancock, and Ahmed; Claim 15 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hancock in view of Leung; Claims 16 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hancock in view of Watanuki et al. and Khalil et al.; Claim 18 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Watanuki et al. in view of Momona, Hancock, and Khalil et al.; and Claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over O'Neil et al. in view of Leung.

Applicants acknowledge with appreciation the indication of allowability regarding

Claims 6 and 7.

Briefly recapitulating, the present invention (Claim 1) is directed to a mobile communication control system having a plurality of access nodes. The present invention addresses, among other problems, the inability of prior art systems to cloak the location of a destination mobile terminal because those systems rely on the care of address (“CoA”) of the destination mobile terminal in order to route packets thereto. In particular, in many prior art systems, the source mobile terminal is aware of the CoA of the destination mobile terminal. See page 4, lines 4-9 of the Specification.

To address the privacy problem, the present invention (Claim 1) includes, among other things, a source access node, a destination access node, and a mobile node. Each of those nodes includes an address changer configured to replace a destination address provided in a packet destined for the destination mobile terminal. The source access node replaces the first address of the destination mobile terminal with the second address of the destination mobile terminal, the destination access node replaces the second address with the third address of the destination mobile terminal, and the mobile node replaces the third address with the first address of the destination mobile terminal. All replacements are accomplished without increasing the size of the header of the packet. The replacement of the address is also referred to herein as the replacement feature. See, by way of non-limiting example, Figure 9 of the Specification.

Claims 4 and 5 are directed to a network management server of a mobile communication network. The network management server includes an address manager configured to manage the first, second, and third addresses of the destination mobile terminal in accordance with information received from the mobile node and the destination access node. An address assignment transmitter is configured, among other things, to transmit address assignment directions for directing a source access node to update an address

conversion table of the source access node to include the first address of the destination mobile terminal. See, by way of non-limiting example, Figure 10 of the Specification.

Another problem addressed by the current invention is the increased size of the header of packets due to encapsulation in the routing process. See page 3, lines 2-28 of the Specification. To that end, Claim 9 is directed to a mobile communication system including, among other things, a source access node, an anchor node, a destination access node, and a mobile node. The anchor node includes, among other things, an address changer configured to replace a destination address in the packet transmitted from the source access node. The second address of the destination mobile terminal is replaced by the third address of the destination mobile terminal. The address changer is further configured to encapsulate the packet using encapsulation information. See, by way of non-limiting example, Figure 15 of the Specification.

Claims 12 is directed to a network management server of a mobile communication network. The network management server includes an address manager configured to manage the first, second, and third addresses of the destination mobile terminal in accordance with information received from the mobile node and the anchor node. An address assignment direction transmitter is configured, among other things, to transmit an address assignment direction for directing a source access node to update an address conversion table of the source access node to include the first address and the second address of the new mobile terminal. See, by way of non-limiting example, Figure 16 of the Specification. Claim 13 includes a similar feature.

The system of Claim 16 is similar to the system of Claim 1 with a few exceptions. In particular, the system of Claim 16 manages two addresses of the destination mobile device as opposed to the three addresses managed by the system of Claim 1. Consequently, the address changer of the mobile node is configured to replace the second address of the destination

mobile terminal with the first address of the destination mobile terminal.

Claim 18 is directed to a mobile node similar to the mobile node defined by Claim 16. However, Claim 18 defines that the address manager assigns a second address of a new mobile terminal included in a predetermined range of addresses assigned by the destination access node in accordance with an address assignment request transmitted from the new mobile terminal, so as to manage a first address and the second address of the new mobile terminal. See, by way of non-limiting example, Figure 18 and page 38, lines 14-18 of the Specification.

Claim 19 is directed to an access node in a mobile communication network. The access node includes an address assigner configured to assign a predetermined range of addresses to the mobile node in accordance with an address assignment request transmitted from the mobile node, the predetermined range of addresses being selected from among a range of addresses assigned to the destination access node.

In the present invention, a first address is a home address of the destination mobile terminal, the second address is the address indicating the destination access node allocated to the destination mobile terminal, and the third address is the address indicating the mobile node allocated to the destination mobile terminal.

In the Office Action, Applicants respectfully point out that different definitions not corresponding to the definitions above are applied to the first address, the second address and the third address of the present invention, respectfully.

In the present invention, routing is completed between each node by changing a destination address of a received packet to an address indicating a next node on a communication route. A header size can be reduced more by the aforementioned feature than can be reduced by encapsulation. In addition, since it is not necessary to route through a home agent, it is possible to optimize a route. Moreover, since it is not necessary to notify a

care of address of the destination mobile terminal to a source mobile terminal, it is possible to solve location privacy problems.

In contrast to the present invention (Claim 1), the Inoue '974 patent is directed to a mobile computer communication scheme which relies upon a care of address management unit. As discussed in column 19, lines 36-44 and illustrated in Figure 19 of the Inoue '974 patent, the home agent 5 of the private network includes a care of address management unit 52 for managing the current location address of a destination mobile terminal 3. Upon receiving a packet destined for the mobile terminal 3, the encapsulation and transfer unit 53 encapsulates the packet for relay to the current location of the mobile terminal 3. The Inoue '974 patent fails to teach or suggest replacing a destination address of the packet. Rather, by encapsulating the packet, an address is added to the packet. The original address remains.

The Watanuki et al. patent fails to address the deficiencies of the Inoue '974 patent. In particular, the Watanuki et al. patent relies upon packets including both home and foreign addresses of target mobile devices provided in a header. See Figures 14-17. An additional movement header is added to the packet when mobile nodes in different networks communicate with each other resulting in an enlarged header.

The official action asserts that Khalil et al. remedies the deficiencies of the Inoue '974 patent and the Watanuki et al. patent. In light of the clarification to claim 1, Applicants respectfully traverse. Khalil et al. teaches a method of tunneling which requires a "single level of encapsulation." That is, as illustrated in Fig. 4 of Khalil et al., the home address  $MN_2$  of the destination mobile terminal is not replaced by a second destination address  $MFA_3$ . Rather, applying the single level of encapsulation, Khalil et al. teaches adding the second destination address to the header. In contrast, claim 1 defines an address changer which replaces the home address (i.e., the first address) with the second address.

Consequently, the Inoue '974 patent do not teach or suggest the subject matter defined

by claim 1 when considered alone or in combination with Watanuki et al. and/or Khalil et al.

Claims 4 and 5 have been amended to clarify that a packet is transferred from a source mobile terminal of a source access node to destination mobile terminal. The official action asserts that the private network home agent 5 of the Inoue '974 patent constitutes the source access node and that a mobile terminal connected to the home agent 5 constitutes the source mobile terminal of claims 4 and 5. Applicants respectfully traverse. Figure 4 of the Inoue '974 patent merely illustrates how a mobile terminal 3 can connect both to a private network 1 and the Internet 2. Figure 4 and the corresponding disclosure do not teach or suggest how to manage addresses of both source and destination mobile terminals.

In particular, the Inoue '974 fails to teach or suggest (i) an address assignment direction transmitter configured to transmit address assignment directions for directing a source access node to which the source mobile terminal is connected to update an address conversion table of the source access node to include the first address and the second address of the destination mobile terminal (claim 4), or (ii) an address assignment direction transmitter configured to transmit an address assignment direction, the address assignment direction directing a source access node to which the source mobile terminal is connected via radio link to update an address conversion table of the source access node to include the first address and the second address of the destination mobile terminal (claim 5).

The Leung patent does not address these deficiencies. The Leung patent merely discloses a mobile router connected to a foreign agent similar to the Internet home agent of the Inoue '974 patent. Thus, the Inoue '974 patent is not believed to anticipate or render obvious the subject matter defined by Claims 4 and 5 when considered alone or in combination with the Leung patent.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Momona in view the Inoue '120 patent and Khalil et al. Applicants respectfully traverse. Momona is

directed to an encapsulation process wherein a packet is encapsulated in a packet destined for a foreign local multicast address. In contrast thereto, Claim 8 defines an access node including an address changer configured to replace a destination address in a packet transmitted from a source access node.

The official action asserts on page 17 that the local registration unit 121 of Momona corresponds to the address assignment information transmitter of claim 8. Applicants respectfully traverse. Claim 8 requires that the transmission of address assignment information is accomplished in accordance with an address assignment request transmitted from a mobile node. In Momona, the location registration unit 121 forms part of a mobile node. Consequently, any assignment information transmitted by the unit 121 is not in accordance with an address assignment request transmitted by the mobile node.

Regarding the Inoue '120 patent, that patent fails to address the deficiencies of the Momona patent. The DHCP server 7 of the Inoue '120 patent is part of the home network of a mobile computer. In light of the multicast approach of Momona, there would not have been a reason to modify Momona to have a DHCP server receive second and third addresses of a destination mobile terminal. Consequently, Momona is not believed to anticipate or render obvious the subject matter defined by Claim 8 when considered alone or in combination with the Inoue '120 patent.

Khalil et al. are not believed to remedy the deficiencies of Momona as Khalil et al. uses a single level of encapsulation as discussed above. For the foregoing reasons, the 35 USC 103(a) rejection of claim 8 should be withdrawn.

Regarding claim 9, the official action acknowledges on page 23 that the combination of Hancock, Watanuki et al., and Soliman fail to disclose replacing a destination address of a header with increasing the size of the header. However, the official action asserts that Khalil et al. teaches that feature and that it would have been obvious to modify the combination of

Hancock, Watanuki et al., and Soliman to include the header feature.

Claim 9 has been amended similar to claim 1. As illustrated in Fig. 4 of Khalil et al., the home address MN<sub>2</sub> of the destination mobile terminal is not replaced by a second destination address MFA<sub>3</sub>. Rather, applying the single level of encapsulation, Khalil et al. teaches adding the second destination address to the header. In contrast, claim 9 defines an address changer which replaces the home address (i.e., the first address) with the second address. Thus, the 35 USC 103(a) rejection of claim 9 should be withdrawn.

Regarding the address assignment direction transmitter feature defined by claims 12 and 13, the official action states that “[i]t is inferred the DHCP [of the “Inoue ‘120 patent] have the capability to transmit the mobile computer address.” Applicants respectfully traverse. Column 13, lines 17-32 of the Inoue ‘120 patent merely teaches that the DHCP sends a Care-of-Address to a mobile computer 2. Regarding claim 12, the Inoue ‘120 patent fails to teach or suggest an address assignment direction transmitter configured to transmit an address assignment direction for directing a source access node to update an address conversion table of the source access node to include the first address and the second address of the new mobile terminal, and to transmit an address assignment direction for directing the anchor node to update an address conversion table of the anchor node to include the second address and the third address of the new mobile terminal and the encapsulation information, a source mobile terminal being connected to the source access node. Regarding claim 13, the Inoue ‘120 patent fails to teach or suggest an address assignment direction transmitter configured to transmit an address assignment direction for directing the anchor node to update an address conversion table of the anchor node to include the second address and the third address of the destination mobile terminal and the encapsulation information.

Hancock merely teaches an anchor node. However, Hancock does not teach or suggest an address assignment direction transmitter. Thus, the 35 USC 103(a) rejection of



claims 12 and 13 should be withdrawn.

The official action asserts that Hancock teaches the replacement feature of the present invention. Applicants respectfully traverse. Page 4, lines 10 and 11 of Hancock teach that an anchor 8 encapsulates packets to tunnel them to an access router 5. The encapsulation process increases the size of the header.

As addressed above, Leung and Watanuki et al. also fail to teach or suggest the replacement feature of the present invention. Consequently, Hancock is not believed to anticipate or render obvious the subject matter defined by Claim 15 when considered alone or in combination with the Leung patent and/or Watanuki et al.

Claim 16 has been amended similar to claim 1. As illustrated in Fig. 4 of Khalil et al., the home address  $MN_2$  of the destination mobile terminal is not replaced by a second destination address  $MFA_3$ . Rather, applying the single level of encapsulation, Khalil et al. teaches adding the second destination address to the header. In contrast, claim 16 defines an address changer which replaces the first address (i.e., the home address) with the second address. Hancock is not believed to remedy the deficiencies of Khalil et al. for the reasons discussed above. Thus, the 35 USC 103(a) rejection of claim 16 should be withdrawn.

Regarding Claim 18, Applicants respectfully submit that neither Watanuki et al. nor Momona teach an address manager of a mobile node configured to assign an address to a new mobile terminal wherein the address is selected from a predetermined range of addresses assigned by a destination access node. Momona does not teach or suggest selecting the address because each mobile unit is assigned all of the multicast addresses.

Khalil et al. do not teach or suggest changing a destination address from a second address to a first address (i.e., the home address). Rather, Khalil et al. teach a change of address in an opposite manner (i.e., from the first address to the second address). The Hancock publication is relied upon to teach anchor nodes having a range of addresses

available for assignment, and is not believed to remedy the deficiencies of Khalil et al. regarding the replacement feature of the present invention. Thus, the 35 USC 103(a) rejection of claim 18 should be withdrawn.

Regarding claim 19, the O'Neil et al. patent publication is directed to an apparatus which utilizes multiple uplinks and reverse tunneling. The Official Action concedes on page 43 that O'Neil et al. do not explicitly disclose having an address assigner. Applicants agree. However, the Official Action further asserts that the Leung patent discloses an access node configured to assign care of addresses to a mobile router. Column 9, lines 27-67 of Leung teach obtaining a collocated care of address which is temporarily assigned to an interface of the mobile node for a mobile router. As conceded in the office action, the Leung patent does not teach that the assigned address is obtained from a range of addresses. However, the official action asserts that Hancock addresses this deficiency. Applicants respectfully traverse. Hancock does not teach or suggest that a range of addresses is predetermined and selected from a range of addresses assigned to a destination access node. Thus, O'Neil et al. are not believed to anticipate or render obvious the subject matter defined by claim 19 when considered alone or in combination with Leung or Hanover.<sup>1</sup>

Dependent claims 2, 3, 7, 10, 11, and 17 are believed to be allowable for at least the same reasons that the independent claims from which those claims depend are believed to be allowable.

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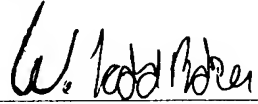
<sup>1</sup> Applicants made the same arguments regarding claim 19 in the prior amendment. It does not appear that the Office Action has addressed those arguments.

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In view of the foregoing, no further issues are believed to remain. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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